AMERICAN VETERINARY REVIEW,

SEPTEMBER, 1893.

EDITORIAL.

VETERINARY LEGISLATION.—We suppose that reporters and gossips on scientific subjects, meaning, for our present purpose, those of the veterinary persuasion, are of much the same breed with other common carriers of intelligence and rumor in their liability to commit occasional errors, and that their "on dits" ought to be accepted with a proper modicum of caution, and, moreover, with the idea that when they are subsequently demonstrated they should also be promptly acknowledged, with a due apology for their occurrence. We find that, not differing from others in the journalistic line, we have ourselves become somewhat blameworthy in certain matters, and we now tender the apology which becomes in order under the rule.

In our May issue, when speaking of a new bill which had been presented to the Legislature in Albany, we stated that *we "were told"* (nothing more) that the project in question was fathered by the New York State Veterinary Society. The bill was a bad one. Its tendency is to prevent the advancement of veterinary practice in the Excelsior State. Its enactment is a disgrace to the body which accomplished it, and it is perfectly proper that the State Association should defend itself against our animadversions, as well as against the bill itself, and this is well done in the following letter, received from Dr. N. P. Hinckley, the worthy Secretary of the New York State Veterinary Medical Society:

Prof. A. Liautard:

DEAR SIR:—I have just returned home from an extended trip, and in reading the REVIEW, which had come to hand during my absence, I find a very conspicuous notice regarding the extension of the registering law in this State, and that the writer takes particular pains to say that the New York State Veterinary Medical Society was the *principal actor* in having this extension granted. Now there is positively no truth in that assertion, and as proof of what I say I would refer you to the proceedings of the New York State Veterinary Medical Society published at different times in the AMERICAN VETERINARY REVIEW and other journals. The New York State Veterinary Medical Society was organized for the purpose of calling together the members of the profession in this State who were graduates from veterinary colleges or universities, for the better protection of themselves and the elevation of the profession in the State by having such laws as you mentioned repealed, and a law passed compelling every man who is desirous of practicing the profession to be a graduate of a veterinary college or university, or pass a State Board of Examiners, or both. This, we believe, would in time elevate the standard of the profession in this State far above that of any in the Union. This has been our aim from the date of organization, and if all the members of the profession in the State would take a personal interest in the matter, it could be accomplished. The members of the New York State Veterinary Medical Society most earnestly desire that the members of the profession throughout the country should understand that they had nothing to do with the passing of said act.

Trusting that you will give this article as conspicuous a place in your journal as the one referred to occupied, I am

Yours, etc.,

N. P. HINCKLEY.

We have done justice to the doctor's proper claims, and we think that the matter ought to rest there. But we must remind him that we are excusable for listening to an "on dit," especially as the REVIEW has not been favored with any report of the doings of the New York State Veterinary Medical Society for more than a year, with the exception of the proceedings of the meeting in 1892, and a postal-card notice of the meeting in January of the present year. The REVIEW, however, always desires to treat everyone impartially. "Open to all" is its motto.

VETERINARY LEGISLATION IN CALIFORNIA.—It may take time, and years may come and go, but it is bound to become materialized, and to accomplish its end long before old Europe will have laid out the means to abolish it. We refer to the subject of improper practice of veterinary medicine, and the legal recognition of veterinary quacks. States will attempt

to secure proper legislation, and will fail; others will do the same, and will partially succeed, for the time being, only to become complete masters of the profession a little later; and others, probably in small numbers, will at length reach the end of their labors, to wit—the enactment of laws for the regulation of veterinary practice in such a manner that, once for all, quackery will be doomed within their boundaries. We have quite a piece of good news from California, where, in the *Poultry Cultivator*, Dr. R. I. Whittlesey, D.V.S., makes the following statements:

After two previous failures a third attempt proved a charm, and a bill regulating the practice of veterinary medicine and surgery in California was passed at the last session of the legislature.

It had very little opposition, and it passed as introduced, without mutilation.

It is the best law on this subject in the United States, and is as liberal toward the non-graduates as they could ask.

By this act the Governor appoints an Examining Board of five veterinarians, whose business it shall be to hold examinations periodically at San Francisco and Los Angeles, when all who wish to practice in the State must procure a license. Graduates submit their diploma, and if it is all right receive a license. Non-graduates must pass an examination sufficiently strict to satisfy a majority of the board, when a license will be issued to them.

These licenses must be recorded with the county clerk in the county in which they are to be used, and then kept displayed in the office or place of business.

The law went into effect on the 24th of May last.

The board consists of Dr. Maclay, of Petaluma; Dr. Archibald, of Sacramento; Dr. Spencer, of San Jose; Dr. Rowland, of Pasadena, and Dr. Whittlesey, of Los Angeles.

The first examination took place at the Baldwin Hotel, San Francisco, May 24th; the second at the Hollenbeck Hotel, Los Angeles, June 26th.

All non-graduates who fail to pass their first examination have the privilege of coming up at any future examination until December 31st, 1893, after which non-graduates are barred, and only graduates need apply.

It works no hardships, as the quacks are given ample time for preparation, and if they are successful are elevated to the standard of graduates without nearly the same effort or expense.

After all have had opportunities for receiving their license the illegal practitioners will be prosecuted, and even if they should not be molested the public can know who they are and need not employ them. Their bills cannot be collected.

The law will be a great protection to the public, who have for years been imposed upon by a horde of unscrupulous practitioners.

The non-graduates came from all parts of Southern California, San Luis Obispo, Fresno, and, in fact, nearly every town of any size was represented. The examination took up two days and part of the nights.

Of course some of those who failed to pass were disgruntled and thought they should have passed, but others have expressed their entire satisfaction, and say they are going to study hard and come up again with hopes of better success next time.

Those who did pass are more enthusiastic over the success of the law than the graduates, and have woke up to a new state of things, are reading and propose to make themselves more competent and keep pace with the advance of science.

WHY NOT BE A VETERINARY SURGEON? — We reprint from one of the Boston journals an article under this head, from the pen of Dr. Austin Peters.

The motives which influence the choice of young men of the present time who are assuming the labors of veterinary study and subsequent practice, and who appreciate the value of veterinary medicine, greatly vary. In one case, it is the *eclat* of the success which he hopefully anticipates is sure to crown his widely extended practice. In another, it is the exalted professional standing and recognition which he expects to win. In a third, it will be the exercise of his ability in teaching, and the enjoyment of his bent as an investigator of the practical and theoretical phenomena pertaining to his calling. With another, it will be the apparent, but only apparent, chance of obtaining a livelihood by an unexacting and moderate kind of labor like that of the missionary whose preaching is a mere oral exhortation and written doctrine, instead of being a faith which is proved by its works.

In writing the article in the *Youth's Companion*, Dr. Peters has done a good work for the profession of his choice, and has expressed himself in plain, well-chosen words. He has told his young compatriots what their advantages are likely to be should they enter the veterinary profession, with the privileges that wait for them, and he has indirectly asked them to enter the ranks of the army of veterinarians. He speaks frankly of the schools and colleges of this continent, and we have no doubt that his words will have the effect of inducing many desirable young men to enter our ranks and become *American veterinary graduates*, and side by side with their good adviser learn to write their names with the suffix of D.V.S., M.R.C.V.S.

AN OUTBREAK OF RABBIT SEPTICÆMIA

WITH OBSERVATIONS ON THE NATURE OF THE DISEASE AND ITS SPECIFIC ORGANISM.

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In the winter and spring of 1893 a considerable number of rabbits, in the breeding-pens at the Experiment Station of the Bureau of Animal Industry, perished from a disease which was characterized by exudative pleuritis with or without pneumonia. In a few of the animals there was marked peritonitis. In the exudates, a germ which was identified as the bacillus of rabbit septicæmia was invariably demonstrated. The infrequency with which spontaneous outbreaks of rabbit septicæmia occur led to a somewhat careful study of this disease, the more important features of which, together with the result of a few investigations with the specific organism, are here recorded.

The investigations of rabbit septicæmia which have heretofore been made have pointed out two very interesting facts. (1) *The existence of a bacillus in decomposed albuminous substance, and in contaminated water† which is capable of producing a rapidly fatal septicæmia in rabbits when they are inoculated with these substances or with a pure culture of the bacillus, and (2) the appearance of a disease in rabbits caused by a bacillus closely related to, if not identical with, the one found in the first instance. The only report of this disease occurring spontaneously in rabbits appears to be that of Dr. Theobald Smith‡ in 1887. Although it is not our purpose to discuss the identity of the germ which is capable of inducing a fatal septicæmia when injected into the rabbits,

*Koch, Wundinfectionskrankheiten, Leipzig, 1878, p. 59.

†Gaffky, Mittheilungen a, d, Kais. Gesundheitsamte, 1881, I.

‡A contribution to the study of the microbe of rabbit septicæmia. The Journal of Comparative Medicine and Surgery, Vol. VIII, (1887), p. 24.

with the one which found its way in the body of the animal apparently by a more natural method, it seems desirable to point out the two sources from which the germ has been obtained, and the two conditions under which the disease has been described.

In the outbreak from which Dr. Smith obtained the germ which he studied, eight rabbits were known to have perished. The lesions found in the animals that were examined were characterized by an inflammatory condition of one or more of the serous membranes. The bacteria were found in large numbers in both the inflammatory products and the various organs. They were rapidly fatal to rabbits when injected subcutaneously in small quantities of a pure culture.

In the epizootic of this disease about to be described, the features that are worthy of special consideration are: (1) The very marked localization of the lesions; (2) The relation that exists between the fatal form of the disease and a rhinitis (not necessarily contagious); (3) The feeble virulence of the specific germ and its relation, morphologically, biologically and in its pathogenic properities, to attenuated swine plague bacteria. The study of the specific organism of this outbreak is of considerable interest in view of the fact that the writings of several investigators tend to identify the bacillus of rabbit septicæmia with that of *swine plague*, *Schweineseuche*, *Wildseuche*, *fowl cholera*, a peculiar form of pneumonia in cattle, and possibly other forms. The very close relation that exists between the specific bacteria of these diseases was very clearly set forth by Dr. Theobald Smith as early as 1891.* The disease in rabbits appears not to have heretofore been traced from primary lesions in the nasal mucosa to its more fatal localization on the serous membranes.

HISTORY OF THE OUTBREAK.

From time to time, one or more of the breeding rabbits at the Experiment Station have been observed to be suffering

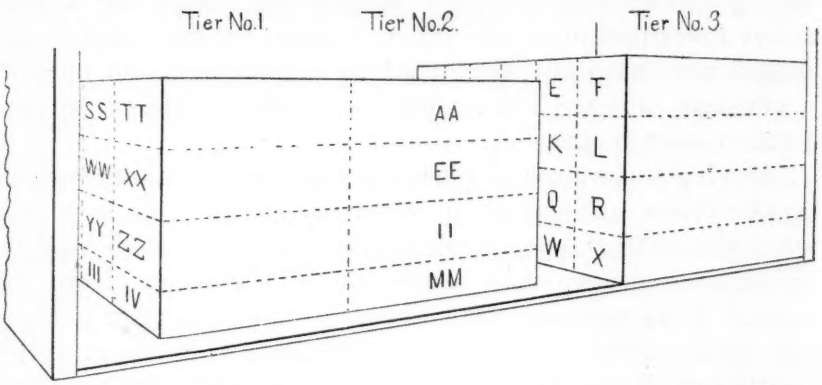
*Special report on the cause and prevention of swine plague. Department of Agriculture, 1891, p. 141.

from what appeared to be a nasal catarrh, or "snuffles," as the affectation was termed. Occasionally rabbits have died presumably from this trouble. The infrequency of such deaths among the rabbits was very largely the reason for a less active investigation of the isolated cases, for such occasional deaths were naturally attributed to confinement, old age, or accidental causes. The young, or stock rabbits, rarely suffered from this affection.

During the winter of 1892-93 a considerable number of the stock rabbits, one-half to three-fourths grown, were kept in a small detached stable. Several of these rabbits died of pneumonia and pleurisy, and nearly all of the others were observed to be suffering with a muco-purulent discharge from the nasal cavities. Little notice was taken at that time of the deaths or of the nasal difficulty, which were attributed to pneumonia and nasal catarrh due to the exposure of the rabbits to the sudden changes in temperature and the excessively cold weather to which they were not accustomed. Later the breeding rabbits which were kept in another building began to die. During March three or four died suddenly, and upon examination were found to be similarly affected as those dying from the stock-pen. It was also observed that many of the other rabbits were suffering from a similar rhinitis.

The rabbits kept for breeding purposes were housed in pens about three feet wide and four feet deep. These were arranged in three tiers each four pens high. (See diagram of pens.) The pens were in a small building, which, during the winter, was kept at a temperature of about 60 to 70° F. during the day and 45°-60° F. during the night, by means of a coal stove. The light was good, but during the winter the ventilation was not as good as could be wished. The rabbits were not crowded. They had plenty of water, and their food consisted of clover hay, oats and wheat bran mixed, and more or less green vegetables. Cut hay was used for bedding. The pens were kept clean and every known precaution was taken to promote the health of the animals. The young of these rabbits were removed to the stock-pens as soon as they were of sufficient age. The rabbits were thrifty and in

good condition when the disease appeared, and with few exceptions the dead rabbits were not emaciated. The accompanying diagram shows the arrangement of the pens.



QQ	RR	SS	TT
UU	VV	WW	XX
Y	YY	Z	ZZ
I	II	III	IV

Tier No.1. Front View.

AA	BB	CC	DD
EE	FF	GG	HH
II	JJ	KK	LL
MM	NN	OO	PP

Tier No.2. Front View.

A	B	C	D	E	F
G	H	I	J	K	L
M	N	O	P	Q	R
S	T	U	V	W	X

Tier No 3. Front View.

The first of the breeding rabbits to die were examined by Dr. Kilborne who found extensive pleuritis. Subsequently the dead animals were brought to the laboratory where they were carefully examined. As soon as the seriousness of the disease was realized all of the rabbits were inspected and those suspected* of having the disease were removed, and the pens thoroughly disinfected. By repeating the disinfection after each death and removing immediately all suspected rabbits the outbreak was abated, but not until after many deaths had occurred. About one-third of the rabbits that were affected with the rhinitis died in a short time and a few of those that were isolated perished in the course of several weeks.

*The only evidence of disease that could be found among the living animals was a mild or more severe rhinitis, and it was by that symptom that the rabbits were separated.

Rabbit. No.	Date of Death.	Rabbit from Pen.	Condition of Pleura.	Condition of Lungs.	Condition of Peritoneum.	Cultures from Blood.	Cultures from Liver.	Cultures from Exudates.	REMARKS.

Rabbit. No.	Date of Death.	Rabbit from Pen.	Condition of Pleura.	Condition of Lungs.	Condition of Peritoneum.	Cultures from Blood.	Cultures from Liver.	Cultures from Exudates.	REMARKS.
454	March 29.	AA	Exudative pleuritis.	Hepatized.	Normal.*	Clear.	Clear.	Bacteria.†	.....
459	April 1.	BB	"	Partially collapsed.	Peritonitis.	"	"	"	.....
460	" 1.	YY	"	Hepatized.	Normal.	"	Bacteria.	"	.....
476	" 10.	M	"	"	"	"	Clear.	"	.....
477	" 10.	MM	"	Partially collapsed.	"	....	"	"	....
478	" 11.	I	"	Hyperæmic.	"	Clear.	"	"	.....
479	" 12.	....	"	Partially collapsed.	"	"	Bacteria.	"	.....
489	" 14.	RR	"	Emphysematous.	.....	....	....	....	[tures. Badly decomposed; no cul-
488	" 14.	MM	"	.....	.....	....	....	....	" " " ‡
482	" 18.	J	"	Emphysematous.	Normal.	Clear.	....	Bacteria.	.....
499	" 22.	X	"	Hepatized.	"	....	....	....	No cultures.§
500	" 25.	A	"	"	"	....	....	Bacteria.	.....
1	" 25.	....	"	Hyperæmic.	"	....	....	....	No cultures.
3	" 29.	FF	"	"	"	Clear.	Clear.	Bacteria.	.....
6	May 4.	T	"	"	"	"	"	"	.....
7	" 4.	Q	Normal.	"	Peritonitis.	"	"	....	.....
11	" 16.	QQ	Exudative pleuritis.	Hepatized.	"	"	"	Bacteria.	.....
12	" 18.	YY	"	"	Normal.	....	. ..	....	No cultures.
15	" 19.	N	"	"	"	Clear.	....	Bacteria.	....
20	" 25.	VV	Normal.	Normal.	Peritonitis.	"	....	....	.....
19	" 26.	III	Exudative pleuritis.	Hepatized.	Normal.	....	....	....	No cultures.
26	June 3.	....	"	Hyperæmic.	Peritonitis.	....	....	....	No cultures.

* Normal indicates that no change was noticed in the macroscopic examination. In many instances cover-glass preparations were made by drawing a cover over the peritoneum either on the abdominal wall, over the liver, or intestines. When stained they exhibited no bacteria.

† Non-motile, rabbit septicæmia bacteria. In cover-glass preparations from the exudate they exhibited the polar stain.

‡ Rabbit examined at station. The lesions were not noted in full on account of advanced decomposition. No cover-glass preparation from exudate.

§ In every case (except No. 488) where cultures were not made, the bacteria were demonstrated in stained cover-glass preparations from the exudates.

In the appended table is given a list of the rabbits that died from the breeding-pens, the pens in which they were kept (for relation of pens to each other see diagram), the gross lesions as found on post mortem examination, and the distribution of bacteria in the organs of the rabbits as indicated by the bacteriological examination. The fact should not be omitted that in stained cover-glass preparations from the spleen, liver and blood no bacteria were found in any of the animals, while in similar preparations from the exudates they were invariably present in large numbers, excepting in No. 488, where no examination was made.

From the facts recorded in the table it will be observed that the disease was practically identical in its manifestations in all of the rabbits examined. It will furthermore be noticed that the lesions were localized in every instance, and that judging from this outbreak alone the term septicæmia does not convey the correct idea of the nature of the disease. The specific organism, however, resembled so closely the germ which has been described as the bacillus of rabbit septicæmia that little doubt can be entertained that it was an outbreak of that diseaee in which the germ was attenuated to such a degree that it could no longer multiply in the blood and induce a general septicæmia. The localization was very marked, and its similarity to attenuated swine-plague bacteria in its preference for the serous membrane is exceedingly striking. The lesions were so uniformly constant that it seems unnecessary to record the individual post mortem notes, but simply to describe the symptoms and pathology as they were observed in the disease as a whole.

Symptoms.—The general manifestations of the disease were usually slight. In the beginning of the outbreak the disease was so insidious that many of the rabbits were not observed to have been ill. Upon closer observation it was found that only rabbits which were suffering from a rhinitis died, and consequently after the first few deaths the disease could usually be foretold by the nasal difficulty. An occasional peculiar snuffling sound, accompanied by shaking of the head and rubbing of the nose with the feet was noticed in nearly all

cases in which the rhinitis was marked. The nasal discharge was usually observed for from several days to a few weeks without any noticeable effect upon the general health of the animal. For a day or two before death the rabbits ate sparingly and sat in a somewhat crouched position.

Pathology.—The rabbits were not emaciated, excepting a few old females that were nursing young. The most characteristic lesion was an inflammation of the pleura or peritoneum with the effusion of a small quantity of serum and the migration of round cells. The pleura was most often affected. Usually the pleural cavity contained a large quantity of cellular substance. The parietal pleura was covered with an exudate composed of fibrin cells and bacteria. In rabbit No. 6 the lungs were covered with a thin, grayish, membranous exudate, which was removed with difficulty. In ten cases the lungs were more or less hepatized. The others were hyperæmic with areas of collapse, excepting in No. 20, where they were normal, and Nos. 489 and 482, where there was marked emphysema. In all cases of hepatization the dependent portion of the cephalic lobes were affected, and in most instances the dorsal portion of the principal lobes. Upon section the hepatized tissue presented a grayish (necrotic) appearance. The bronchioles were filled with a thick muco-purulent substance. The microscopical examination of sections of the lung tissue that were hardened in alcohol showed the alveoli to be filled with round cells and the capillaries distended with blood. In the areas where the disease was more advanced the cells were breaking down. The changes in the dependent portion of the cephalic lobes were invariably more advanced than the hepatization elsewhere, excepting where the entire lung was necrotic.

The trachea contained more or less purulent substance, and the mucosa was deeply reddened. The larynx was usually nearlly filled with muco-pus. The mucosa of the nares was thickened and opaque. In nearly every case the nasal cavities contained considerable muco-purulent substance. In Nos. 15, 20 and 26 there was exudative peritonitis with pleurisy, and in Nos. 7 and 19 peritonitis only. The livers were

invariably enlarged and reddened, due to hyperæmia. They contained a very large amount of pigment, which appeared in granules from 0.8 to 2.0 μ in diameter. It resembled in form the grains of gunpowder. The pigment was usually observed lying between the cells. In most cases the liver cells were more or less fatty. In stained sections (rabbits Nos. 476 and 15) the pigment showed as bluish particles, the capillaries were distended with blood. The cell nuclei and interlobular tissue were not appreciably changed. The spleens were normal in size and color. The kidneys were hyperæmic, and in most instances the tubular epithelium was granular. In stained sections (from rabbits Nos. 476 and 15) parenchymatous degeneration was more or less marked. The blood vessels were usually injected. There was no apparent thickening of the intertubular tissue. The bladder contained very little or no urine. The stomachs, as a rule, contained little food. There was no visible intestinal lesions. The lymphatics were apparently normal.

Bacteriological Examination.—The speciffc bacteria were demonstrated, as previously stated, in the pleural and peritoneal exudates, but never in cover-glass preparations from the various organs and blood. Cultures were made from nearly every animal that was in a suitable condition, and in every case those from the blood remained sterile, and in only two out of eleven cultures from the livers did the rabbit septicæmia bacteria develop. The bacteria were localized on the serous membranes, more especially the pleura. The cause of the lung infection will be apparent from the fact, which will be further discussed, that the bacteria presumably gained entrance to the pleural cavity through the bronchioles and air-cells. The power of the attenuated forms of the swine-plague group of bacteria to multiply on the serous membranes of rabbits has elsewhere* been brought out by one of us (V. A. M.), but in no other investigations or experiments have we found such a marked example of this property of bacteria as in this outbreak.

* Appendix. Special report on the cause and prevention of swine-plague, Department of Agriculture, 1891.

THE BACILLUS OF RABBIT SEPTICÆMIA.

In the study of the outbreak just described careful comparative cultures were made from the bacteria obtained from several of the rabbits, and in all cases stained cover-glass preparations from the exudates were carefully examined. There was no difference found in the character of the bacteria, and the evidence was conclusive that the same species of organisms was present in the different animals. The virulence might have differed, but in the germs tested (those from three rabbits in all) this property was identical. In the description of the morphological and biological characters here recorded, a culture from rabbit No. 500 was used.

Morphology—A non motile bacillus with ends rounded. In stained cover-glass preparations made from the exudate of the dead rabbits it appeared as an elongated oval germ with more or less polar arrangement of the protoplasm. It varied in size from 1.2 to 1.8 μ in length, and from 0.8 to 1.0 μ in width. There were frequently many involution forms which were especially interesting from the fact that the cellular substance appeared to be concentrated at one end of the elongated form, which frequently assumed a sack-like appearance. These were especially observable in preparations from rabbits that were not examined until ten hours after death. In cultures they were slightly smaller. They stain readily with the ordinary aniline dyes, but do not retain the coloring matter when treated by the Gram or Weigert-Gram methods.

Biology.—On agar it developed a grayish, viscid growth. It did not grow on potato or in gelatine. It produced no appreciable change in milk. It imparted a uniform cloudiness to alkaline bouillon, and changed its reaction in twenty-four hours to a strongly acid one. After several days standing a thin, grayish band was deposited on the sides of the tube at the surface of the liquid, and a grayish, viscid sediment collected in the bottom of the tube. It did not develop in acid bouillon. In the fermentation tube containing bouillon plus two per cent. glucose, it imparted a cloudy appearance throughout the liquid. It fermented glucose but did not produce gas.

Very marked indol and phenol reactions were obtained with a culture that had grown for eighteen days. Its thermal death point, power to resist drying, and to survive in sterilized water were determined. An exposure in a water bath for five minutes at a temperature of 58° C. destroyed its vitality. Upon cover-glasses exposed to the atmosphere under a bell jar it lost its power of development when inoculated into bouillon in forty-eight hours. It perished in sterilized distilled water in eleven days.

It will be observed that morphologically and biologically this bacillus does not differ appreciably from the swine-plague germ, except, perhaps, in its indol reaction, which I have never found in similar cultures of swine-plague bacteria. It was found by Dr. Smith in one case.

Pathogenesis. — Mice, pigeons and guinea-pigs remained well after an inoculation with from 0 1-0.2 cc. of a fresh bouillon culture. Rabbits inoculated subcutaneously with a similar quantity of the virus developed quite severe local abscesses but finally recovered. A rabbit inoculated intravenously with 0.4 cc. of a fresh (twenty-four hour) bouillon culture perished on the fifth day with exudative pleuritis, pericarditis and peritonitis. A second rabbit inoculated with a similar quantity of the culture died on the sixth day. It exhibited a cellular exudate over both parietal and pulmonary pleura. The dorso-median portion of the principal lobes of both lungs were in a state of red hepatization, the cephalic lobes were collapsed; heart muscle was pale, and contained dark blood clots; mucosa of trachea injected; liver pale, fatty; spleen enlarged, dark and friable; kidneys hyperæmic; in the intermuscular tissue about left knee and right elbow joints were small abscesses containing pus and rabbit septicæmia bacteria. Stained cover-glass preparations from the various organs contained very few bacteria. Those from the exudate and pus from abscesses exhibited an innumerable number of polar stained germs.

A short series of inoculations were made for the purpose of accelerating the virulence of this bacillus. The results were negative.

A rabbit inoculated in the ear-vein with 0.6 cc. of a pure culture died in about forty-four hours, and its organs contained innumerable bacteria which exhibited a marked polar strain in carefully prepared preparations. A second rabbit inoculated with 1.0 cc. died of septicæmia in twenty-four hours. In large doses, therefore, it produced a rapidly fatal septicæmia. In these cases the disease could not be distinguished either by the lesions or the number and appearance of the bacteria in stained cover-glass preparations from the organs from the disease produced in rabbits with a small quantity of virulent swine-plague bacteria.

The organism obtained in this epizootic of rabbit septicæmia has been found by a comparative study to differ from the swine-plague germ in its excessive attenuation the marked indol reaction and in certain morphological characters, which, however, are more rarely observed in the involution forms of the virulent swine-plague germ. The outbreak is further illustrative of the extent of the distribution and manifestation of this group of bacteria. Although the source of the germ has not yet been determined, the fact of its producing a local disturbance in the nares, and, subsequently, in many cases, pleuritis and pneumonia, is of considerable importance, not only in its relation to rabbit septicæmia, but also in the suggestions which it offers concerning the etiology of certain forms of pneumonia in other animals as well as in the human species.

RHINITIS IN RABBITS AND ITS RELATION TO RABBIT SEPTICÆMIA.

From the preceding pages it will be observed that rhinitis in rabbits has been somewhat common, and that in this outbreak of rabbit septicæmia the nasal trouble preceded the fatal localization of the disease. This association of the two affections led to an investigation of the rhinitis. In some instances the nasal trouble was very slight, while in others there was a more profuse discharge accompanied with difficulty in breathing. Upon examination the nasal mucosa was found to be whitish (opaque), thickened, and covered with more or less muco-pus. The examination of stained cover-glass

preparations from the nasal discharge showed bacteria which resembled those of rabbit septicæmia in greater or less numbers. They were much more numerous in preparations made from scraped mucosa than in those from the secretions. The presence of these bacteria was expected in cases where the lung disease was advanced, but usually in those cases the nasal symptoms were less marked. Their appearance in the nasal cavities of rabbits suffering from the rhinitis only indicated a causal relation existing between these bacteria and the rhinitis. The temperature of the rabbits suffering from rhinitis was normal, but when the lungs or pleura became affected the temperature was elevated. In order to trace the course of the disease several of the rabbits that were suffering with rhinitis were killed and examined. This demonstrated the fact that the rhinitis was usually the starting point of the disease.

RABBITS WITH RHINITIS THAT WERE KILLED FOR EXAMINATIONS.

Rabbit. No.	Rhinitis Appeared.	Rabbit removed from Pen.	Rabbit Killed.	Suffered from Rhinitis.	Lesions.
26	May 8, '93	I	June 8	30 days	Rhinitis. Trachea hyperæmic, dependent portion of cephalic lobe of right lung hepatized, rabbit septicæmia bacteria.
28	May 8, '93	E	June 3	25 days	Severe rhinitis. Lungs normal, rabbit septicæmia bacteria from nasal secretions.*
39	May 8, '93	R	Jun. 22	45 days	Rhinitis. Lungs normal, rabbit septicæmia bacteria from nasal mucosa† scrapings.
27	May 9, '93	YY	June 7	29 days	Rhinitis. Right lung collapsed, pleura covered with cellular exudate, rabbit septicæmia bacteria.
55	June 22, 93	FF	Jun. 28	6 days	Severe rhinitis, lungs normal, rabbit septicæmia bacteria.

* Rabbit septicæmia bacteria isolated from impure liquid cultures by means of agar plates.

† A rabbit inoculated with the cultures obtained from the nasal mucosa perished of rabbit septicæmia. Pure cultures were obtained from its organs, and in cover-glass preparations from the same the polar stained bacteria were found in large numbers.

A more detailed description of the lesions that were found in the different rabbits is appended.

Rabbit No. 26.—In a fairly good condition. The nasal cavities contained considerable muco-pus. Mucosa thickened, pale. The mucosa of the larynx and upper trachea hyperæmic. In the dependent portion of the cephalic lobe of the right lung a small area of hepatization. Bronchioles in hepatized portions filled with muco-pus. The secretions from the nasal cavities, tracheal mucosa and bronchioles contained rabbit septicæmia bacteria, as indicated by stained cover-glass preparations.

Rabbit No. 28.—Female, pregnant. The nasal cavities contained very much muco-purulent substance. Mucosa thickened, deeply reddened. Lungs normal, heart muscle pale, liver fatty, bouillon tubes inoculated from the blood and liver remained clear. One inoculated from the nasal discharge developed an impure culture of rabbit septicæmia bacteria, which were isolated by means of agar plate cultures.

Rabbit No. 39.—In good condition, considerable abdominal fat. The abdominal and thoracic organs appeared to be normal. The mucosa of the nasal cavities thickened, opaque, and covered with a muco-purulent substance. Stained cover-glass preparations from the nasal secretions exhibited very few bacteria, but in those made from scrapings of the mucosa showed many polar stained, rabbit septicæmia bacteria. A tube of bouillion inoculated with the scrapings from the base of the mucosa developed apparently a pure culture of the bacillus of rabbit septicæmia. A rabbit inoculated intravenously with 0.75 cc., died in about thirty-six hours. Innumerable polar stained bacteria were present in cover-glass preparations from the liver, spleen and blood. Pure cultures were obtained from the blood and spleen.

Rabbit No. 27.—Was somewhat emaciated. The nasal cavities were empty. Mucosa not appreciably affected. Tracheal mucosa deeply reddened, due to the injection of blood vessels. The left lung and heart were normal. The right lung collapsed and encased in a thick layer of grayish, partially organized cellular exudate. Liver hyperæmic. Spleen slightly en-

larged. Kidneys firm, pale. A small quantity of thick, very cloudy, alkaline urine. Microscopical examination of sediment showed the presence of a few granular casts. Stained cover-glass preparations from the pus enclosing the lung, revealed innumerable rabbit septicæmia bacteria. Cover-glass preparations from the nasal mucosa exhibited rabbit septicaemia bacteria.

Rabbit No. 55.—Not emaciated. The abdominal and thoracic organs appeared to be perfectly normal. The mucosa of the trachea and larynx were slightly reddened, due to the injection of blood vessels. Pharynx apparently normal. The nasal cavities contained a considerable quantity of grayish purulent substance. The mucosa of the nares thickened and whitish. Very few bacteria were found in the cover-glass preparations from the discharge, but in those made from scrapings of the mucosa there was a moderate number of oval polar stained bacteria. A tube of bouillon was inoculated from the scrapings at the base of the mucosa, this developed apparently a pure culture of rabbit septicæmia bacteria. Agar plate cultures were made from the bouillon culture. Only colonies of rabbit septicæmia bacteria developed.

The number of rabbits that was killed for examination was sufficient to show the cause of the nasal difficulty. The attenuated condition of the bacteria accounts for their long residence in the nasal cavities without injury to the rabbits other than the rhinitis. In rabbit No. 15 the left ovary and terminus of fallopian tube were encased in a pus sac. The chronic nature of the disease can be appreciated by the fact that several of the rabbits (Nos. 11, 12, 15, 19, 20 and 29) were known to have suffered from the rhinitis from ten to twenty days prior to their death. These were first observed to be affected and were removed from the breeding-pens together with about ten others May 8th. Since that time a few other rabbits have been affected and removed.

In the latter part of July the surviving rabbits were killed for other purposes. They exhibited no lesions excepting a thickening of the nasal mucosa. About one-half of the rabbits that were affected with the rhinitis in the breeding-pens died. The cause of death was due to pleuritis, pneumonia or perito-

nitis. None of the breeding rabbits recovered, although the nasal symptoms improved in some instances. Among the stock rabbits a smaller per cent of deaths occurred and a few apparently recovered. The disease, however, is of considerable importance, since rabbits, especially adults, once affected with it can never be considered safe for some kinds of experimental work.

Two experiments were made to test the communicability of the rhinitis from one rabbit to another. June 3, two young rabbits (Nos. 29 and 30) were placed in a pen with an adult rabbit that was suffering with rhinitis. July 12th, No 29 showed symptoms of rhinitis and July 14th No. 30 was affected. July 20th there was a profuse nasal discharge with accompanying difficulty in breathing. Temperature normal. July 26th rabbit No. 30 was killed for examination. No lesions were discovered excepting a thickening of the nasal mucosa with a profuse muco-purulent discharge from the nasal cavities; cover-glass preparations from the mucosa exhibited polar-stained bacteria. A second exposure was made with an adult (old) rabbit. This gave negative results. The affected rabbits that were used in the experiments continued to suffer from rhinitis.

The length of time that elapsed after the exposure before the young rabbits developed symptoms of the nasal trouble and the failure of the adult rabbit to contract the disease after a two months' exposure would indicate that it was not a rapidly contagious disease.

The source of the germ is of much interest and importance. A careful bacteriological examination of the material used for bedding and food for the rabbits gave negative results. A considerable number of healthy rabbits have been examined, but thus far the germ has not been found in the normal flora of their upper air passages, although bacteria not distinguishable from it in their biological properties have been found in the upper air passages of many of our domesticated animals. In an unpublished article* by one of us (V.A.M.) on "The pathogen-

*Bulletin No 8. Bureau of Animal Industry, Department of Agriculture, Washington, D. C.

ic and toxicogenic bacteria in the upper air passages of domesticated animals," attention is called to a few attenuated bacteria that were found in the air passages of certain healthy animals, which resembled the swine-plague group in their biological characters. Although the evidence is not at hand to establish the fact, our knowledge of the variations that exist in the virulence of the various members of the group of bacteria to which the bacillus of rabbit septicæmia belongs, indicates the possibility of the existence of saprophytic bacteria which, when taken into the nasal cavities might, under as yet unknown conditions, become more parasitic in their nature, and eventually produce the rhinitis and its sequela. In septicæmia, caused by wound infection, we find a somewhat analagous condition, for many of those cases have not been traced to an infection by specific bacteria that are capable of living as parasitic organisms only. In fact some cases have occurred where an infection with germs that have not lived in a condition that would destroy the known species of bacteria that produce septicæmia, seems impossible. Again the experiments of Koch and Gaffky with rabbit septicæmia would indicate the possibility of the existence of these bacteria under certain conditions in nature outside of the animal body.

STUDY OF THE PATHOLOGICAL ANATOMY OF PULMONARY GLANDERS.

By Professors E. Leclainche and L. Montane, of the Toulouse Veterinary School (France).

Translated from the *Annales de l'Institut Pasteur*.

(Continued from page 229).

A.—Histogenesis of the Glanders Tubercle.

Adult glanders tubercles appear in the lungs of horses under the form of rounded nodules, varying in size from that of a seed of millet to that of a pea, and irregularly disseminated in every part of the two lobes. Upon exploration, the superficial centers upon slightly raising the pleura give the

sensation to the finger of a hard, fibrous nucleus enclosed in the elastic tissue of the organ. Upon section, the tubercle shows a thick, fibrous envelope intimately embedded in the surrounding parenchyma, and a caseous structure of a dirty white color, which is easily removed by scraping. But again, we very often find in the same lung younger forms, whose different aspects correspond to the various periods of development. It thus becomes easy to follow the successive changes of the superficial tubercles, and also becomes possible to judge of the rapidity of the successive transformations, according to the number of lesions of a similar type which come under our observation.

The tubercle is first indicated by a rounded ecchymosis of a dark red color, with a diameter varying from that of a seed of millet to that of a dime. A grayish point soon appears in the center of the hemorrhagic spot, and spreads rapidly. This incipient tubercle has the form of a semi-transparent, homogeneous, gray granulation, and is composed of an elastic tissue of a fleshy consistency. Sometimes a trace of the primary ecchymosis appears in the form of a rosy areola on the periphery. At a later period, a deep gray focus appears of a dirty white color on the center of the gray spot, gradually increasing, while the peripheric zone loses its transparency and becomes more dense in its structure; and as soon as this density becomes perfect, only a rounded mass of a uniform yellowish gray aspect can be recognized, and the nodule assumes the characteristics of the adult tubercle already described.

The histological analysis enable us to follow, step by step, the successional development of these alterations. The formation of the nodule is preceded by an inflammation of the sub-pleural and interlobular lymphatic tracts of the region. The pleural and sub-pleural lmyphatic spaces show themselves in great part dilated and gorged with round cells; in the interlobular connective tissue, the lymphatic vessels are also distended; at some points, dilatations filled with leucocytes, resembling a minuscule closed follicle, are met with. The vascular sheaths are infiltrated, and the dilated vessels

are surrounded by a ring of round cells. The sub-pleural connective tissue and that of the interlobular trabeculæ are œdematous, and are infiltrated with migrating cells, both isolated and gathered in masses. In the whole extent of the involved tissue, the glanders bacilli are found free between the cells, and regularly disseminated throughout.

The development of the superficial tubercle always occurs in the neighborhood of the pleura, or of an interlobular band, often taking place at the point of union of the pleura with a band, or again at the junction of the two bands. The result of this is that the tubercle seems under-stretched, and partially limited by a band of inflamed cellular tissue.

The inflammatory center includes a group of alveoli, filled with finely granular fibrine, the remains of a primitive hemorrhage, enclosing some mononuclear leucocytes. The alveolar walls are thickened, and contain leucocytes and some free bacilli, the latter principally in the neighborhood of the connective band. This incipient tubercle is identified by a rounded ecchymotic spot under the pleura.

In the second period, the central portion of the primitive focus of pneumonia is overrun by an active immigration of leucocytes, which infiltrate the walls and fill the alveoli, appearing under section as a strongly colored bunch of grapes. Bacilli, not yet very numerous, are seen in the alveolar walls and in the cavities of the vesicles. All around the central focus of leucocytic apoplexy there exists a zone of fibrinous pneumonia which does not undergo noticeable transformations. The contents of the alveoli have, however, become more granulated, and are colored of a slight rosy tint, with the picro-carmine. By contrast, the surrounding pulmonary tissue undergoes marked modifications of reaction; this zone is indicated by the evolution of a more or less extensive epithelial pneumonia. The epithelium of the vesicles now drop off and proliferates, filling up the alveolar cavities, and at this stage the tubercle is seen under the aspect of a grayish, semi-transparent granulation.

The central focus rapidly undergoes the caseous degeneration, involving at one time the alveolar walls and the immi-

grant leucocytes. The cellular roundness loses its smoothness, and all that remains is a mass of irregular granulations looking like nuclei undergoing segmentation, with some cellular elements in various degrees of degeneration. The bacilli are more numerous, and may be detected in the whole extent of the diseased center. At the same time, the reacting layer of interstitial pneumonia spreads by the multiplication of the connective cells and of the leucocytes, and the alveolar cavities, gradually obliterated, are no longer indicated except by star-like depressions. We may then recognize in the tubercle a degenerated center, granular and colored, formed of cellular remains; a middle layer with festooned outlines of fibrinous pneumonia, and an external layer of interstitial pneumonia.

The presence of the center of degeneration is indicated on the surface of the lung by the appearance of a white, opaque spot in the middle of the gray granulation of the preceding period.

In the fourth stage, the zone of interstitial pneumonia extends by degrees at the expense of the fibrinous disease. This, still indicated by some irregular spots enclosed in the neoformed tissue, soon disappears entirely. The interstitial pneumonia then constitutes by itself, around the central caseous nucleus, a compact cellular wall in which two distinct layers can be found. One, the internal and larger, is formed of large yellowish cells, among which those of the giant kind are not uncommonly found; the other, external and thinner, is formed of delicate connective fasciculi, separated by round cells with large nuclei of an embryonic nature. The internal layer may with propriety be called the "epitheloid zone," while the external is the incipient of the fibrous envelope. The degeneration of the center is complete. The bacilli exist on the periphery only, and are no longer visible in the central part. Only some granulous rods, scarcely colored, can be detected. A last stage is marked by the completion of the surrounding fibrous and epitheloid belts.

There is then a caseous central focus, a middle zone, composed of epitheloid cells and showing several narrow grooves,

marks of alveoli which have disappeared; and an external zone, fibro-embryonal, due to an accumulation of young rounded cells, widely nucleated, and mixed with delicate connective fasciculi. Bacilli have completely disappeared, or, at least, can no longer be made apparent to the unaided vision. At the periphery of the nodule, the pulmonary structure is permeable; yet the walls of the vesicles are thickened by an embryonic neoformation, and hold together only by means of the external fibrous layer.

Thus constituted, the tubercle undergoes none but regressive alterations with external manifestations. The epitheloid zone gradually disappears, as the result of the degeneration of the internal limitating surface and of the growth of the external fibrous envelope. At a later period, there remains but the amorphous granular contents, enclosed in a resisting capsule, composed of concentric connective fasciculi intimately united, and containing between them a few connective cells.

B.—Alterations of the Lymphatic Tracts.

These alterations, which precede and accompany the evolution of the glanders tubercle, are constituted essentially by a gathering of leucocytes in all regions overrun by the bacilli. The sub-pleural connective tissue, and that of the interlobular bands, are from their origin œdematous and infiltrated. The conjunctive cells are plainly visible, and their anastomotic branches form a well-marked cellular network, whose alveola are filled with migrating cells, both isolated and gathered into small groups. Some have a large nucleolus and a thin layer of protoplasm; others a small nucleoles and a definite protoplasmic zone.

Again, in some places, the leucocytes are accumulated in more compact and extended patches, regularly rounded, and situated in the center of the dislocated connective tissue. The cellular elements, strongly colored, are enclosed by a fine reticulum.

Again these foci of leucocytes may be agglomerated, and constitute by their reunion a peculiarly interesting form, re-

sembling lymphodenoma. With a low power they appear under the pleura as a round mass, formed of ten or fifteen rounded or ovoid follicles, granular in appearance, situated in a stroma of similar aspect, but clearer and more condensed at the periphery in a surrounding envelope. The aspect is that of a lymphatic gland. The lesion is developed on the course of an interlobular band, a short distance from its union with the pleura. The band may be clearly seen divided into two fasciculi, which separates in order to surround the neoformation. One pushed toward the pleura is confounded with it, while the other separates the diseased focus from the surrounding pulmonary structure, which has remained healthy. The nearest alveoli, compressed and flattened, present themselves under the form of narrow and irregular fissures. With a stronger power the follicles were seen to be gorged with leucocytes well colored, and provided with a large nucleoli. Here there is an appearance of larger elements, with yellowish protoplasm, finely granular, forming grayish spots on the dark, rosy bottom of the section. Running through the follicles there is a delicate network of lymphatic capillaries, and between the elements a fine, connective reticulum is observed. The spots occupying the center of the lesion contain elements orange red in color, and having a brilliant homogeneous appearance, which have undergone a certain degree of vitreous or waxy degeneration.

In the interfollicular septa, short glanders bacilli are seen, small in numbers, but perfect in form. Their presence is made more difficult to determine in the follicles by the strong coloration of the round cells; they are detected, however, in the wide spaces situated around the walls.

These pseudo-tubercles are in the perilobular connective tissue, or in the interalveolar partitions, while the inflamed connective tissue of the surrounding regions reminds one of the normal reticulated tissue, so these neoformations are strongly suggestive of the lymphodenoma, the resemblance becoming still closer if it be admitted that the reticulum of the lymphoid tissues is a cellular network, as Laguesse* has

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Laguesse—(Development of the spleen in fishes).

attempted to establish by his researches in the development of the spleen.

Lymphoid tubercles have quite a peculiar aspect. They are seen on the surface of the lung, in the form of a regularly rounded, well defined nodule of a slightly yellowish translucent tint, or of an opaque rose color; the surface, somewhat convex, is raised up by the pleura; but the surrounding pulmonary tissue is not altered. On section a tissue is found of a fleshy consistency, very finely granular and perfectly homogenous throughout, at least in the earlier periods of evolution.

These forms seem to exist in numerous cases of glanders in the horse, though but few of them are found in any single subject. In one patient which had powerfully reacted to malleine, but two processes of this nature were encountered, and no other lesion of the lung or of the mucous membrane could be detected. A second case was obtained by the examination of a portion of a lung, taken from an animal also destroyed after the test of malleine. A third example was taken from a lung presenting numerous glanders tubercles of different ages, one single nodule presenting the characteristics mentioned; but those were sufficiently perfect to permit the histologic form of the lesion to be described in advance.

(*To be continued*).

CASTRATION OF CRYPTORCHIDS.

By Prof. F. Mauri, of the Veterinary School of Toulouse, France.

(Continued from page 248).

CONTENTION OF THE ANIMAL FOR OPERATION.

Veterinarians who castrate cryptorchids hold various opinions as to what is the best mode of restraining the patient during this operation. Mr. Degive says:

"To operate easily by the inguinal method, the animal must be thrown on his back, with all four legs flexed against the trunk and fixed by lateral bipeds (one anterior and one posterior, of the same side) on a level, and back of the elbow

to two solid rings secured to a strong strap or rope, surrounding the superior and lateral regions of the chest, a little back of the withers.

"This position completely exposes the inguinal region, and almost totally relieves the compression upon the arm of the operator, a compression which during the powerful and repeated retractions of the abdomen and of the posterior leg becomes very great. This position, although the easiest, is not the only one, however, which contributes to bring the operation to a successful and satisfactory termination.

"Most commonly we operate, like Mr. Dieriex, with the subject thrown and secured, as for ordinary castration, upon the side opposite to that in which the testicle is concealed. In this case, the various joints of the secured leg must be kept flexed as much as possible, the exposure of the inguinal space corresponding with the degree of the flexion.

"Mr. Dieriex places a long and rather large bundle of straw under the thigh, close to the body of the animal, in order to prevent a change of position and keep him nearly on his back the moment the testicle is brought out."

As we have said before, in the Danish mode the animal is secured on his back with his posterior parts raised. Mr. Jacoulet, like Mr. Capon, throws the patient on the opposite side to the one where the cryptorchidy exists, and secures the corresponding hind leg as in ordinary castration. The animal is then placed in the dorsal position, with little bundles of straw packed on each side, and secured with plate-longes attached to the extremities. Again, like Mr. Capon, Mr. Jacoulet recommends anesthesia, as much to overcome the pain as to render the manipulations safer and easier.

In all my castrations of cryptorchids, I have simply fixed the patient as in ordinary castration, casting him on the side opposite the one on which the ectopia exists. This is not only simpler and easier than the other methods, but it gives me more confidence in the results of the operation. Indeed, in the dorsal position the inguinal ring and the interstice, continuous with it, are opened widely and dilated for the introduction of the hand. The declivity of the opening made

through the peritoneum in order to reach the testicle, is a favoring circumstance for the introduction into that cavity of the blood which may have escaped from the laceration of the cellular tissue. And this will be especially possible if, as is not uncommonly the case, the testicle is not found immediately and without searching, and if, when the hand having been withdrawn for rest, it may, when re-introduced, carry with it not only blood but also threads of lacerated connective tissue, which may prove more than the most favorable media for the culture and growth of septic micro-organisms.

In the mode of securing the patient for ordinary castration, the hand of the operator always follows an upward course, and when it enters the peritoneum, has been, as it were, wiped off and cleansed, the blood and the fatty fragments which are set free being afterward carried out by the declivity of the region; and, moreover, the animal is better secured, his movements more restricted, and the action of the surgeon more certain. According to Mr. Degive, "it is promotive of expedition in double cryptorchidy to keep the animal on his back, with his four legs flexed against the trunk. To move the body slightly on the right or the left, as the case may require, is sufficient to bring to a successful result the ablation of one or other of the testicles."

For myself, I will never advise operating upon a double cryptorchid at one sitting. I think it more prudent to wait before removing the second testicle until after the entire cicatrization of the first wound. The anesthesia recommended by Nielsen, Ostertag, Capon, Jacoulet, etc., I entirely disapprove.

The operation of the inguinal tract by the simple laceration of the connective tissue, which is the most important step of the operation, gives rise to only an insignificant amount of pain. The ablation of the testicle in ectopia is done either with the ecraseur or by limited torsion, without feeling on the part of the animal, considering the extreme atrophy of the elements forming the cord. The ordinary castration is much more painful. As for the execution of the manipulations, it is neither easier nor more certain by the immobility which

anesthesia produces. The hand which is pushed through the inguinal ring and then the interstice, is guided by given points of an absolute fixity, which the motions of the animal (very limited as they are) cannot displace. Then anesthesia has not only no real advantages, but, on the contrary, seems to offer serious objections. First, it consitutes a complication of the operation, especially in the hands of practitioners who may not be familiar with the use of ether or chloroform, and it may give rise to fatal accidents, especially in the ordinary conditions of practice, in consequence of the difficulty of obtaining sufficiently pure anesthetics. Chloroform is often sophisticated with very irritating chlorated acids, the administration of which produces effects of a very dangerous character.

But that which is to be specially feared in the operation which we are considering is the *muscular resolution* produced by anesthesia, as well as the loss of sensibility. The flaccidity which follows in the small oblique, as in all other muscles of animal life, by the action of the anesthetics, is one of the most favorable of conditions for the occurrence of an eventration. Indeed, during the operation, when the testicle is drawn out from the peritoneal cavity into the inguinal tract, one feels the posterior border of the small oblique, which immediately applies itself upon the crural arch after the passage of the testicle, as if to prevent the protrusion of the intestines. Evidently, if the operation is performed with the use of anesthetics, the removal of the contractility of this muscle must involve the dangers of eventration. And again, the animal sleeping under the influence of anesthetics does not recover when the operation is finished within half an hour, three-quarters, and at times even a whole hour. During the period in which he lies upon the bed, he soon makes attempts to get upon his feet and rises on his fore legs, while the hind legs continue powerless and the animal falls back. And it is only with shaking and trembling that at last he succeeds in rising. During these struggles all the conditions for pressure from within outward by the intestinal mass are realized. I have experimentally judged of the effect of the relaxation of

the small oblique in the production of eventration. In numerous operations made on special subjects, I have often observed eventrations when the animals were destroyed immediately after the perforation of the inguinal interstice, and under the influence of the cadaveric flaccidity the relaxed small oblique has easily permitted the intestines whose peristaltic contractions have continued to enter the wide opening made by the hand of the operator. At the cavalry school of Saumur, where anesthesia is always used, a bandage is always applied to prevent eventration after the operation.

Mr. Degive, with the same object as Mr. Jacoulet of keeping the intestines in place in case an eventration should take place after the operation, closes the wound of the scrotum with sutures. Like Mr. Degive, I took the same precaution with the first eight horses on which I operated, but since then, having seen its uselessness, I have in my last four operations (three abdominal and one inguinal) left the wounds to themselves without any suture and dressing, and I have had no reason to regret the result.

Preparation of the Region—Instruments.—The inguinal region and surrounding parts being well exposed, they are to be thoroughly washed with soap, well wiped out, and then submitted to a second washing with Van Swieten's solution.

Let me remark at this point that the operator and his assistant must also have their hands and arms thoroughly washed, the hands quite clean, and the nails freed from all impurities. Washing with corrosive sublimate solution is the thing required.

The selection of instruments is very simple. A convex bistoury, an ecraseur or torsion forceps, all thoroughly cleansed and dipped in an antiseptic solution.

I prefer the torsion to the ecraseur. But this would better be employed when the cord is short, and the testicle cannot be readily drawn close to the inguinal ring.

Modus Operandi.

Though delicate, the operation is one of great simplicity. It will be better to consider abdominal cryptorchidy as being

the most difficult, and the one which demands greater acquaintance with its conditions. Inguinal ectopia is much less serious. The testicle, more or less engaged in the inguinal space, can easily be secured with similar manipulations, less the perforation of the peritoneum.

Abdominal Cryptorchidy.

The operation is divided into five steps: first, exposure of the inguinal ring; second, perforation of the inguinal tract; third, prehension of the testicle; fourth, ablation; fifth cleaning the wound.

1.—*Exposure of the Inguinal Ring.*—With both hands the operator makes a transversal fold to the scrotum, outward of the raphy at the place where the testicle ought to be. While an assistant takes hold of one of the extremities of the fold to keep it on the stretch, the operator, with a convex bistoury, makes a perpendicular incision in its middle, intersecting the scrotum and dartos, and measuring about fifteen centimeters (about seven to eight inches). It is sometimes possible that the dartos is not completely divided at this step of the operation, and in this case it is necessary to carefully expose the subdartoic connective tissue by a few strokes of the bistoury, and then lacerate until the inguinal ring can be reached, which is done by the fingers being carried to and fro until the ring is felt by its posterior commissure, indicating—as it does—the course the hand of the operator has to follow.

2.—*Perforation of the Inguinal Tract.*—This most important and delicate step of the operation must be performed with the hand corresponding to the side of the testicle in ectopia, viz., the left hand must be used when looking for the left testicle, and *vice versa*. The horse being secured as heretofore described, it is impossible to act otherwise, and to use indifferently either hand as advised by M. Jacoulet.

The operator, with his arm and hand dipped in Van Swieten's solution, introduces the fingers, brought together in cone shape, into the wide funnel that he has just made and in the bottom of which is the inguinal ring. He pushes them in the posterior commissure, or that resisting angle formed by the

common tendon of the abdominal muscles and the crural arch and where these organs take their insertion on the anterior border of the pubis. With sufficient pressure, and with a slight rotary motion, the cone of the fingers soon penetrates through the inguinal ring and is soon followed by the whole hand. This immediately takes the direction of the inguinal tract, and makes room for itself in lacerating the loose cellular tissue that closes it, by pushing obliquely upward, outward and slightly from forward, backward.

During this delicate step the hand might be the means of serious disturbances did the operator not have at his disposal two essential guides: the ascending direction that he must follow is indicated by the position of the external angle of the ilium. And again, and particularly, the hand, though keeping up a slow rotary motion, must always remain resting with the pulp of the fingers upon the crural arch, which being well stretched, enables the operator to avoid laceration of the posterior border of the small oblique. The hand turned backward, with the fingers slightly flexed and resting on the crural arch, will gradually lacerate the connective tissue, while the posterior border of the small oblique smoothly glides over the dorsal face of the fingers. The manipulations must be carried out slowly and carefully. Thus guided, the hand reaches the bottom of the inguinal, near the sub-lumbar region, where the peritoneum is readily felt, more or less resisting, according to the age of the subjects. The pressure of one or two fingers is sufficient to tear it.

3.—*Prehension of the Testicle.*—Generally, the introduction of two or three fingers in the peritoneal cavity is sufficient to take hold of either the epididymis or the testicle itself, and to bring them into the inguinal canal. But sometimes the prehension of the testicle is more difficult, neither the organ itself nor the epididymis being found near the peritoneal opening. In this case it is necessary to immediately introduce the entire hand into the abdomen. This must be done slowly and progressively, and in such a way that the fingers as they proceed will recognize by touch the organs they come in contact with.

Of the seven abdominal cryptorchidies that I have opera-

ted, I had to introduce the whole hand in two cases. In one the testicle was so small that it was scarcely the size of a hazel nut. After taking hold of it several times, and still fearing a mistake, I then had recourse to Degive's method to satisfy myself—that is, to feel for the neck of the bladder, and finding the deferent canal at its insertion, to trace it back to the epididymis and the testicle.

My fourth cryptorchid I operated on a farm, and it gave me another surprise. As soon as my hand was introduced into the peritoneum the animal was taken with violent expulsive efforts, which, pushing the left colon into the pelvic cavity, altered the relative position of the testicle, which then became impossible to follow. The hand was even powerless to find the efferent canal at the neck of the bladder. It took more than half an hour—after the horse, exhausted by his struggles and becoming quiet—for the testicle to resume its position, when it was then secured. It was as large as a hen's egg. No complications followed this accident.

If the hand, when entering the peritoneal cavity, is not too tired, and the fingers have retained their tactile sensibility, it is easy to recognize the testicle and its epididymis. The organ is generally as large as an egg, somewhat flattened and elongated, and of a characteristic consistency. It is soft and yet elastic—the hand taking hold of it and isolating it completely. The ball of fæces for which it is sometimes mistaken has a different form, less soft and without elasticity, and is readily crushed through the thickness of the intestinal walls. The continuity of the tube in which it is enclosed does not permit it to be isolated, and nothing about it can be compared to the peculiar annex represented by the epididymis of the testicle, which is more or less separated from the organ, always very soft, and easily detected by its two enlarged extremities and by the flexuosities of the efferent canal, readily felt with the fingers. At any rate, as soon as the epididymis is secured, the testicle also soon will be, and it is then drawn into the inguinal tract without difficulty. However, when the entire hand has penetrated the abdomen, there is danger that an intestinal loop may follow the testicle into the inguinal

tract. To avoid this accident, which might bring on an eventration, it is prudent to bring the testicle through the peritoneal opening before the hand is removed from the abdomen. To do this, the fingers are flexed from forward backward, the testicle is pushed downward, while the intestines are kept in place with the dorsal face of the hand. This is then withdrawn carefully, carrying the testicle downward more or less, according to the length of the cord. In this motion the posterior border of the small oblique, which was pushed away and encompassed the hand, falls back immediately into position on the crural arch and the opening is closed, its elevated position preventing the exit of the intestinal circumlocution.

Thus it is seen that eventration is but barely possible if one follows strictly the rules of the modus operandi herein described. If, on the contrary, the operator, after passing it through the inguinal ring, immediately turns his hand toward the peritoneum or against the small oblique, not only will the intestines have a tendency to push through the opening thus left dilated, but the accidental laceration of the muscle will remain gaping, and eventration is rendered unavoidable, notwithstanding the best contentive dressing.

A difficulty which must not be overlooked and against which one must guard, is the excessive fatigue of the arm and hand while in the inguinal tract or in the peritoneal cavity, resulting from the efforts of the operator and of the compression made by the muscles of the abdomen and of the thigh. Under its influence the fingers will lose much of their tactile sensitiveness, and will no longer act as intelligent assistants. At such times the inexperienced surgeon may lose his self control, becoming uneasy and uncertain through fear of having undertaken too difficult a task. To continue in such a condition is to expose himself to false manipulations and serious accidents. The surgeon must then stop his work, withdraw his hand and rest himself. He cleanses his arm and hand, dips them several times in cool water and waits until the suppleness and sensibility have returned. Another important precaution not to be neglected, is to avoid reintroducing the hand until it has been thoroughly disinfected with

some kind of antiseptic wash, among which I prefer Van Swieten's solution. This prescription is highly recommeuded by Mr. Degive, and to it I owe the constant success I have met with.

4.—*Ablation of the Testicle.*—Drawn into the inguinal tract, the testicle drops down more or less, according to the length of the cord. Generally there is no trouble to bring it down to the inguinal ring. If the testicle remains concealed higher up I use the ecraseur. In the seven abdominal cryptorchids that I have operated I used the torsion four times and the ecraseur three. I had hemorrhage only in the last case—this was readily stopped with packing. As to the other modes of ablation, such as clamps, ligature, cauterization, etc., they all have serious objections, and I have never used them.

5.—*Cleaning the wound*—The operation finished, the inguinal region is freely sprinkled with cold water, to remove the blood, or to produce by refrigeration a most beneficial hemostasis. The scrotal wound is then wiped dry with a very clean cloth and afterward sprinkled with Van Swieten's solution. As already said, to comply with Mr. Degive's suggestions, I have in four of my cases of abdominal cryptorchidy brought up the edges of the wound with sutures. These, which must be removed after twenty-four hours, have for object to keep the intestine in place and prevent its dropping on the ground should an eventration take place a short time after the operation. I have since neglected this addition to the operation, as I consider it useless.

I have never used the contentive dressing of Jacoulet, which is thus described: "A round pad of oakum, the size of a man's fist, moist with oil, is squeezed at the entrance of the interstice between the lips of the inguinal ring and no farther. Upon it the scrotal skin is drawn and kept in place with a little bunch of straw and secured with four quill sutures, left on for forty-eight hours. After that time hernia is no longer to be feared, and the products of inflammation must have a free exit."

The operation for us then terminates as a simple castration by immediate excision of the testicles.

(*To be continued*).

WHY NOT BE A VETERINARY SURGEON.*

By AUSTIN PETERS, D.V.S., M.R.C.V.S.

To the young man just completing his college course, or the youth about to leave school without going to college, the question, "What shall I do?" presents a most serious problem. "Am I best fitted for a mercantile career," he asks himself, "or do my tastes incline toward one of the learned professions?"

Opportunities for rapid advancement in business are not relatively so numerous as they once were, while the number of applicants for positions is proportionately larger. In the professions the same conditions prevail. There are hosts of young lawyers struggling for a living, young physicians are equally abundant, there is a sufficient number of dentists to supply the demand, and it is not every one who is adapted to success as a minister of the gospel.

While it is true that "there is plenty of room at the top," the top seems farther beyond reach than it used to be, and it is much more difficult to climb from one rung of the ladder to the next.

Yet there is one profession, that of the veterinary surgeon, which, although it has become more prominent of late years, is still unfilled, especially in this country. The United States, with its vast agricultural and live-stock interests, offers a large field for such practitioners.

Until recent years the popular idea, usually borne out by the facts, was that a "horse-doctor" belonged to a low order of beings. He was supposed to be an ignorant, disreputable person, one to be generally avoided unless his services were needed for a sick horse or cow, when he was called in as the custodian of certain traditional stable lore which ordinary individuals were not supposed to possess.

Still some of the old school of "horse-doctors" were thought well of. They were men who had not an opportunity to go abroad to study veterinary science, and yet had

* From the *Youth's Companion*, Boston, Mass.

become good, common-sense practitioners by dint of applying their powers of observation, and reading the veterinary books and magazines published abroad at the time. In those days there were no veterinary colleges nor publications in the United States.

The opinion that a veterinary surgeon is simply a horse and cow-doctor is too narrow. A well-educated veterinary surgeon, besides being useful as a general practitioner, can give valuable advice touching wide interests. His opinion should be sought, and his suggestions followed in outbreaks of contagious disease among animals, and in respect of the public health so far as it is influenced by these maladies.

By far the larger number of veterinarians are and always will be employed in doctoring individual horses, cattle, sheep and other animals, but to many a wide field is and will be more and more afforded. The problem of keeping our flocks and herds in health is closely connected with that of keeping in health the whole body of the people; for the people in general consume the products of some domestic animals and are brought into close contact with others, while it is well known that the maladies of these animals may be "caught" in some form by mankind.

Some of the official directions in which the veterinary surgeon can act are in the army, in the work of the National Department of Agriculture, as scientific investigators at the various state agricultural experiment stations, as professors in the agricultural colleges, as state officials for the suppression of contagious animal diseases, and as members and employees of boards of health.

In continental Europe and Great Britain the importance of having educated veterinarians in the army to advise in the purchase and to preserve the health of the cavalry, artillery and train horses is so well understood that veterinary officials are given commissions, because men of proper education and capability for the work cannot be procured unless accorded the rank, privileges and pay of officers and gentlemen.

The English army has a regular veterinary department. Its chief has the rank of colonel, and those under him descend

in grade as lieutenant-colonels, majors, captains, first-lieutenants, to the more recent appointees, who enter as second-lieutenants. In fact, the most promising of the young veterinarians in England to-day enter the military service.

The military service of the United States does not compare in this respect with that of other civilized countries. With hundreds of thousands of dollars invested in horses and mules for military purposes, there are but a few army veterinarians. Their rank and pay is that of sergeant-major—a non-commissioned officer. They cannot very well associate with the enlisted men, and the officers will not associate with them. Hence they are nondescripts, neither officers or soldiers.

It is to be hoped that this state of affairs will be remedied before many years, although the prospect is not very hopeful.

The Massachusetts Legislature of 1891 passed a law providing for the appointment of a veterinary surgeon on the staff of each battalion of cavalry or battery of artillery in the volunteer militia to rank as first-lieutenant. This, the first step in a needed military reform, it is to be hoped will be followed by the formation of a proper army veterinary department by the national Government.

The United States Department of Agriculture has for several years employed a number of veterinarians in what is known as the Bureau of Animal Industry. Its chief is a veterinary surgeon. He has several assistant veterinarians, who are engaged in the eradication of contagious pleuro-pneumonia among cattle, in the investigation of infectious animal diseases, and in the inspection of animals and meats shipped abroad for food in order to guarantee their healthfulness.

The inspection of animals and meats has been undertaken quite recently, and has already resulted in the removal by Germany and France of their embargoes upon American pork. It will, no doubt, soon benefit still further the American shippers ; and as the work increases in scope, undoubtedly more men will be required.

Many of the States, and especially those whose leading interest is agriculture, now have agricultural experiment

stations, which are supplied with money from the State and National treasuries, for the purpose of scientific investigation of matters of interest to the farmer. Although in most of them the work has been largely connected with chemistry, yet their equipment is incomplete without the aid of a veterinary pathologist and bacteriologist to study the diseases of animals.

Such positions are certain to be created within a few years, opening a number of opportunities to a young man of a scientific turn of mind.

Besides the agricultural experiment stations, we have the State agricultural colleges, which are also supplied with public money. Some of these have chairs of veterinary science on their faculties in order to impart to the young farmer the knowledge necessary to maintain the animals of the farm in a state of health. Other colleges will, no doubt, establish these professorships as soon as their funds will permit, thus providing still more employment for veterinarians.

Another field for veterinary surgeons is as State Veterinarians. The profession has been recognized in this way, more particularly in the great live-stock-raising communities in the West, where it is the duty of State Veterinarians to enforce the laws for the suppression and prevention of the contagious animal diseases. In other sections these laws are insufficient or non-existent, but as the country becomes more highly civilized the evils of infectious animal diseases will become more apparent, and then the veterinarian will find still greater demand for his services.

Another field for veterinary duty is to guard against the public health from diseases common to animals and man, or transmissible from animals to mankind. Hence in all large cities a veterinarian should be a member of every board of health, or one should be an employee.

New York, Jersey City and Brooklyn now have veterinarians connected with their respective health boards, and the Boston Board of Health employs a qualified veterinarian as inspector at the Brighton abattoir. But in the majority of our large cities politics play a more important part in the ap-

pointment of the incumbents to various positions than fitness. Hence insolvent cigar manufacturers and sausage-makers may be appointed as inspectors of slaughter-houses and provisions, instead of men who by their education and training have the requisite knowledge of the subject.

Dairy inspection is another subject that has received but little attention as yet. There are laws providing that unless milk contains thirteen per cent. of total solids, the dealer shall be liable to a fine; yet the sanitary surroundings of the cows and their condition of health receive no consideration whatever. Tuberculosis is not infrequent in cattle, and it is known that milk from tuberculous cows may produce consumption in the human being. Here is then another opportunity for the veterinarian to demonstrate his usefulness.

Though the ranks of veterinarian practitioners are rapidly filling, the profession will doubtless long afford an honorable maintenance to honorable men who engage in it, and occasionally one will be found who, by his special adaptability to the work, or because of particularly favorable surroundings, will be able to retire early with a competency.

The income of a veterinarian will depend much on his ability and environment. A young practitioner whose gross receipts are twelve hundred dollars for his first year's work can be considered as fortunate. If he is successful in the treatment of his cases and is liked by his clients, he ought to do better every year. Yet he will enjoy a larger income than most of his fellows when his annual earnings reach even as much as thirty-five hundred or four thousand dollars.

There are veterinarians who make two or three times this amount, but they form a small minority of the profession, and most of them began their labors years ago, when men educated in this branch of medicine were less numerous than at present.

Those holding public positions as professors, government or state officials receive salaries ranging from fifteen hundred to thirty-five hundred dollars, but many of them require, in addition to a practical education, a scientific training. The services of such investigators of all kinds in the New World are much less in demand than in the Old.

Many a farmer's son in stock-breeding districts, or near populous localities, might take up the study of veterinary medicine with a view to supplementing work on the farm by the practice of this profession. Outside of cities and large towns he would not find enough to do to depend upon the profession as a sole means of support.

The expense of obtaining a veterinary education varies with circumstances. Does the student live in the city where the school is situated, and can he reside at home free of expense to himself? Or does he come from a distance and have to pay for board? Of course, in either case the cost of tuition and text-books, note-books and stationery is the same. One hundred to one hundred and twenty-five dollars per annum for tuition, and forty or fifty dollars for the necessary books, is a fair estimate.

The expense is less if he attends an institution where the course is included in two winter sessions of six months each —as at the American Veterinary College in New York, or the Chicago Veterinary College—than he would be if he entered where attendance is required at three winter sessions of eight months each, as at the veterinary departments of the University of Pennsylvania and Harvard University. But he would have the satisfaction in the latter case of a more thorough training.

If he sees proper and can afford the expense he can go abroad to complete his education. In short, while he can fit himself after a fashion for seven or eight hundred dollars, twelve to eighteen hundred will fit him more thoroughly, or he can even lay out six or seven thousand to advantage.

A young man in order to be a successful veterinarian should have a love for animals and a knack for managing and understanding them, together with a taste for medicine. The pursuit will enable him to lead a healthy outside life, particularly to be desired if his physical condition or mental characteristics render a sedentary occupation unsuitable.

Though his income may not be as large as that of a prosperous practitioner of human medicine, yet on the other hand it will take less time to build up a practice that will render him self-supporting.

A modern veterinarian should and often does possess as good an education as a medical doctor. This being the case, people can no longer look down upon him as belonging to an inferior order of beings.

Therefore the veterinary profession is worthy of the consideration of the young man who is saying, "What shall I do?"

REPORTS OF CASES.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."—VETERINARY RECORD.

HEMIPLEGIA IN A FOX TERRIER—WONDERFUL ENDURANCE TO NUX VOMICA.

BY L. H. HEMPELMAN, D.V.S., House Surgeon.

April 4th a small female fox terrier, suffering with hemiplegia, was admitted to the hospital department of the American Veterinary College.

Her history was somewhat incomplete. She had been taken with a fit, had recovered from it, but was found moving sidewise, the near side of the body being apparently partially paralyzed. A practitioner of the city, who had seen her, thought the dog had received some injury about the shoulder and for a few days had treated her accordingly. As she failed to improve, further advice was sought, with the result that she was admitted to the hospital, with all the symptoms of partial paralysis of the left side of the body, and the animal was placed under treatment. Cathartics were prescribed with tinct. of nux vomica, one drop three times a day, to be gradually increased, so that by the 9th she was taking five gtt. at a dose. The treatment was continued until the 16th, at which time she was so far recovered that she was discharged and taken home.

Four days later she was brought back, having had a second attack of apoplexy. She was then worse than during the first attack, and was completely paralyzed on the left side.

The neck was violently twisted to the right, and she howled with pain when touched on the neck. The former treatment was resumed, starting with five drops of the tincture of nux vomica, combined with doses of bromide of potash to keep her quiet. On the 25th of April she became so nervous, and apparently showing symptoms of over excitement, that all other treatment was suspended for two days, during which she was kept under the influence of bromide in ten grain doses three times a day.

On the 27th the administration of the nux was resumed in ten drop doses, and continued, still gradually increasing until the 18th of May, by which time she was taking twenty gtts. three times a day. For a week the large dose of one drachm of the tincture was given her every day, without any symptom of strychnia poisoning manifesting themselves, but the patient gradually gaining in strength, and by degrees regaining the entire control of her muscular power.

After receiving these doses of tinct. of nux vomica for about a week, it was again gradually diminished, until June 5th, when it was discontinued and the patient discharged, having entirely recovered, with only a slight springhalt of the left hind leg. When it is considered that the dose of nux vomica for a dog of her size is from one to five drops, the amount she took daily is certainly remarkable.

EVENTRATION IN A MARE—RECOVERY.

By R. N. Weightman, D.V.S.

This case is simply reported to serve as a contribution to the history of lesions of the peritoneum in solipeds.

On the 8th of July a farmer called upon me at my office and asked me to see a mare which had staked herself in the body, while throwing herself violently on the ground during an attack of colic. He informed me quite graphically, "that some of her insides was coming out, along with a lot of fat." I got to the case as quickly as possible and found a bad punctured wound on the near side, about three inches from the linea alba and midway between the ensiform cartilage and

the pelvis, large enough to admit three fingers. A portion of the large omentum was hanging out about a foot, and was very bloody and soiled from her continued rolling, and some of the intestines were protruding. I cut away all the soiled parts of the peritoneum and replaced the clean portions along with the intestines, and stitched up the wound, binding the patient up with three strong surcingles, and put her upon anodyne treatment. What I cut away would have covered a large-sized slate. The patient had some slight pains the first and second days after the accident, but has had none since, and was put to work again last Saturday, (the 15th), and has worked ever since,

I think that all dangers are passed. Yet is it so? Two physicians in my town said it was useless for me to attempt the operation, for the patient *must* die, even if she should survive two or three weeks. I am anxious to know the end. The mare seems as well as ever now; the wound is quite healed up, and though she is over twenty years old I do not think she will die from that injury.

PROLAPSUS VAGINA AND UTERUS.

By S. H. Swain, V.S., Decatur, Ill.

I notice in the last issue of the REVIEW, a case of prolapsus vagina and rectum. Thinking it would be of interest to your readers while this one is fresh in mind, I herewith furnish you a few notes of a case I had of prolapus vagina and uterus. It was in a fine Jersey cow owned by Wm. Roach of this city. About two weeks prior to the proper time of parturition the vagina protruded—I do not know just how bad it was out, but presume not so very bad.

Mr. Roach presented his cow to a couple of veterinary surgeons of this city for treatment. I do not know what they did for her, but I do know that they had her in their hospital quite a while, probably from three to five weeks or longer. In the meantime she had a calf and the whole uterus came out. After exhausting their ability they made an unfavorable prognosis of the case, and told her owner that she could not

be cured, and the best and only thing to do was to have her destroyed. Mr. Roach gave his fine cow to the pound-master, Greenberry Martin, and instructed him to take her out and kill her. After arriving at the destination, the pound-master's heart failed him, so he turned her out to eat grass. I was called, but informed Mr. Martin that it was a very bad case and of long standing now, and to save him expense advised him to bring her to my hospital for examination, which he did late in the evening. Myself and my assistant, Dr. Pumphrey, made an examination, but not a very close one, not interfering with the protrusion at all. I told him about the only thing we could do for her was to amputate it and save the cow. After talking the matter over for some time, we decided to treat her for a while first, if not successful we would have to amputate it. I wrote out a prescription about as follows, if my mind serves me right:

Tannic Acid,	℥ i,
Gr. Opii.,	℥ ii,
Ole. Gossyppi Sem.,	℥ viii,

Gave instructions and furnished him with a syringe. He accompanied my assistant to the office, who filled the above prescription, and gave an explanation of the trouble. He first washed the parts nicely in alum water and applied the medicine, also succeeding in putting it part of the way back, but the cow had bad spells, straining so; he found it out the next morning and applied his medicine again, and it never came out any more. We had him inject antiseptic and astringent medicine three or four times a day for two weeks. In just three weeks I made a careful examination. By introducing my hand I found the uterus had all gone to its proper place, and we are glad to state that the cow is sound and well, and the probabilities are the trouble will never recur.

OMENTAL HERNIA IN A HORSE.

By I. Turoot, V.S., Minto, N. Dak.

On July 7th at 6 A. M. I was called to see a horse aged seven years; he had been hooked by a cow during the night

while at pasture. When I arrived at the farm I found the horse standing in the barn and eating hay as if nothing had happened to him. The wound was situated on the right side of the abdomen, below the sixth false rib, and the omentum was protruding about two and a half feet, covered with coagulated blood and serum, and assuming an unhealthy color.

MODE OF TREATMENT: I severed the protruded omentum with the ecraseur close to the body; then I washed and cleansed the parts well with a creolin solution; then I plugged the wound with oakum well dusted with one part of iodoform and two parts of boracic acid, and the whole protected by a wide bandage similar to those recommended in umbilical hernia. I ordered the horse to be fed on bran mashes and linseed gruel. Five days later I removed the bandage and found a healthy-looking wound in a fair way of cicatrization. The wound was dusted every day with the iodoform and boracic powder. The horse made a good recovery and one month later was doing harvesting.

AZOTURIA AND LITHIUM CITRATE.

BY WM. R. CLAUSSEN, V.S., Waupaca, Wis.

On May 4th I was called to see a chestnut driving mare, seven years old. I had seen her an hour previous passing by my residence and noticed then a peculiar stiffness in her gait. On my arrival at the stable I found her down in the stall and diagnosed the trouble as azoturia. I administered lithium citrate and ordered warm applications to the loins after drawing off the urine, which did not appear so very highly colored. Pot. brom. was left to be given to quiet the extreme nervous excitability exhibited. The symptoms showed no amelioration till the seventh day, when she got up and kept her feet for a short time. During the following days she received sol. Fowl. and nuc. vom., and her condition improved steadily so she was able to walk around on the barn floor, and after the lapse of a week the clonic muscular contractions, from which she had suffered to such an extent that she kept up a constant tripping with her hind feet, had entirely disappeared.

I recommended to have her turned into a small enclosure, that she might take whatever exercise she saw fit. This, however, was not attended to. She was taken by the halter a short time morning and evening. In the course of a week she commenced knuckling at the fetlocks and appeared unable to straighten the limbs. In a few days the rectus femoris and vasti muscles had atrophied to such an extent that they felt like a tendon as large as a finger, and the mare was unable to stand.

The case was considered hopeless and the animal was destroyed.

REVIEW OF MEDICAL PROGRESS.

ANATOMY—COMPARATIVE ANATOMY OF THE SIGMOID VALVES OF THE HEART.

By Gilbert and Rogers.

The sigmoid valves of the heart of man are inserted upon a fibrous ring. But this is not the case with the animal series, where the insertion takes place upon the free border of the muscular tables, which are absent in man. The researches made by the authors upon a great number of animals (mammalia and birds) have given them ample opportunities to observe the constant presence of these muscular tables. This conformation and disposition of parts may, however, vary in different species. Birds have three complete aortic rings resting upon each other by their extremities. In the mammalia, there is a space corresponding to the mitral valve, where the muscular fibres are lacking.

The presence of these tables is the cause of the conformation of the arterial orifices of the heart, with modifications varying with their number and their dimensions. The absence of the muscular tables in man must be considered as an inferiority, by exposing the valves to laceration and insufficiency of action.—*Revue des Sciences Med.*

UPON THE BUCCAL GLANDS OF DOMESTIC MAMMALIA.

By B. Barner.

The macroscopic dispositions of the buccal glands vary considerably in different species of our domestic mammalia. These differences, which are not mentioned in our books of anatomy, are as follows: In ruminants, and especially the ox, there exists three buccal glands, one dorsal, one median, and one ventral. In the cat as in the dog, the dorsal gland occupies the orbital cavity, and for this reason is called the orbital gland. In the pig, the buccal dorsal gland is not covered by the matter. These glands also differ in size, according to the species, being largest in ruminants.

The histological study shows that the buccal ventral gland in ruminants is an albuminous gland, furnishing a product of amylolitic secretion. In this it is classed with the parotid.

The dorsal median gland of the ox, with the orbital and the buccal glands of the carnivora, are pure mucous glands. Yet the fluid from these glands possesses a saccharifying property very well marked, especially in ruminants. They are, from a physiological point of view, mixed glands.

The dorsal and median buccal glands of the sheep and goat are distinguished from those of the ox by their cells, which are not evenly mucous. They are either more or less so, or not at all. However, it doesn't appear that they ought to be altogether considered as mixed, but more as mucous glands subject to variations in their functions.

The buccal glands of the horse and those of swine resemble those of the sheep more than those of the ox, but differ from them in some of their characters. They are special mucous glands in which the functional variations and the division of labor are carried to a fine point. They produce, also, besides mucine, an amylolitic ferment.

In relation to the mucous richness, the buccal glands of the carnivora occupy the first place, and then comes the ox with his dorsal and median glands, and then the swine. The sheep, goat and horse occupy the lowest rank.—*Ibid.*

PHYSIOLOGY—CONTRIBUTION TO THE STUDY OF THE MOTRICE FUNCTION OF THE STOMACH IN THE DOG.

By A. Hirsch.

In dogs carrying a duodenal fistula and kept in good health, the evacuation of the contents of the stomach is made by successive acts, taking place at intervals more or less short (a quarter of minute and more). This evacuation begins at a time more or less near to that of the ingestion, influenced by the nature of the food taken in. It begins immediately after the absorption of water, six minutes after that of warm bouillon, and ten minutes after other kinds of food. Each time that the pylorus opens, it only allows the escape of a few cubic centimeters of chyme; at the beginning of digestion, this escapes at short intervals and with a certain pressure, each time gradually diminishing. After a heavy meal, the evacuation of the gastric contents is not completed until fourteen hours. Anesthesia by ether brought on during digestion suspends the evacuation from the stomach, but it returns as the animal wakens. The ingestion of a moderate quantity of fresh, cool water gives it a new activity. The opening of the pylorus seems to be principally stimulated by the liquid consistency of chymified food.—*Ibid.*

PATHOLOGICAL ANATOMY—UPON THE LESIONS OF NERVES IN TETANUS.

By Achard.

In four cases of tetanus, there were lesions of peripherical neuritis occupying principally the traumatic surface and the seat of the contractions, but being also sometimes observed in regions more or less close to those. It was a parenchymatous neuritis, with all the characters of decreasing degeneration. It is probable that this neuritis is related to the traumatism in the same manner as the tetanic contractions themselves. The irritation started from the periphery, and transmitted to the central elements would give rise there, especially to the spasmogenous excitation, and very accessorily to the loss of the trophical power. The mechanism of peripheric neuritis would seem to be the same as in cases of amyotrophy of articular origin.—*Ibid.*

EXTRACTS FROM GERMAN JOURNALS.

By Richard Middleton, D.V.S., Philadelphia, Pa.

INFECTIOUS GASTRO-INTESTINAL CATARRH.

A—— has seen this disease—generally of a benign character—appear in sporadic instances, but in 1891 the affection came as a contagious erizooty seizing upon twenty-three head in a short time. The course was not essentially different from the commoner variety, except in one case where the total stock, comprising seven cattle, became seriously sick over night, one individual dying within ten hours.

On another farm the affection assumed so persistent and at once so malignant a form as to cause death after an interval of ten years from the time of its primary appearance. A— finds no record in contemporary literature of such a virulent catarrh; the following comprises the substance of his remarks upon the subject:

On June 1st he examined the remaining six animals of the above-mentioned instance; great fever, indisposition, unsteady gait and prostration, with noticeable coldness of the whole corporeal surface, marked the cases as out of the ordinary. Paleness of the visible mucous membranes; pain in the abdominal cavity, with hæmorrhagic diarrhœa indicated a gastro-enteritis.

Twice daily they received beer containing eggs and milk as a drench, and also the following:

℞ Opii pulv., ʒi, v,
Creolin., ʒv, xii,
Spiritus, ℥iss, x,
M.

Sig.—Regulate the dose according to size of animal.

Recovery followed the administration of this mixture very rapidly.

Upon post-mortem of the single animal which succumbed previous to our arrival, the muscles were fresh and of a healthy color. The collective organs of the thoracic and abdominal cavities, with the exception of the stomach and intestines, were healthy. The gastric mucous membrane, especially that

of the fourth stomach and small intestines, were intensely hyperæmic, swollen and diffusely colored, showing also petechiæ throughout the area. Erosions of the intestines and large gelatinous infiltration or carbuncular infarctions were not present.

The second occurrence of the affection in the same stable took place some time subsequent, when a cow and an ox were very sick, and a calf had already died. The afflicted were in a soporific state and exhibited symptoms of paralysis, as in parturient apoplexy—protrusion of the tongue and salivation. The ox after many futile attempts to rise relapsed to his former condition, while the cow refused to respond to the strongest irritation.

Pulse imperceptible, respiration normal, peristalsis and defecation suspended. The calf died a few hours after the first symptoms of the attack. Two days later not only were these animals dead, but also another cow and a goat which were kept in the same stable.

Section exposed the following: Fresh and normal aspect of the general myology; serous lining of the cavities sound, and the cavities free of liquid; no alteration of the digestive tract excepting the lining membranes of the stomach and intestines, which exhibited more or less inflammation, swelling and petechiæ—contents of a hemorrhagic mixture. The intensity of the attack, and cause of this infectious gastro-enteritis, reminds one of the lesions in anthrax, Texas fever and malignant aphtha. These diseases, however, were excluded by symptoms wanting intra-vitam and post-mortem, and by inoculation.—*Woch. f. Th. u. Vieh.*

CARCINOMA IN THE HORSE.

The cadaver had been a well-kept horse, and now exhibited as the largest lesion a swelling of the parotid and intermaxillary regions. On the right side of the neck a small potent wound of the skin could be noted, which, when probed, evidently led to the enlargement upon the left parotid space. On the left side a more insignificant and less extensive fistula

gave a similar communication. Between the branches of the inferior maxillary, an ulcerous surface, punctured by numerous fistulæ, led to the sub-maxillary lymphatic glands, which latter were encircled by a white connective tissue envelope.

This new formation occupied the sub-maxillary space, completely usurping the laryngeal region, and becoming continuous with the first-mentioned parotid or retro-pharyngeal swelling.

Microscopic sections revealed carcinoma. The cavities of the stroma were occupied by cylindrical epithelium. From the sub-aural lymphatic glands there proceeded a fistulous tract of perhaps three-quarter inch calibre, which became larger between the larynx and inter-maxillary hypertrophy, terminating in the wound upon the right side of the neck after a course of twelve inches. The left post-pharyngeal glands were also involved in a carcinomatous complication the size of a lemon.—*Berliner W.*

INTESTINAL RESECTION IN THE DOG.

Prof. Degives, of Brussels, following the modes of Hoffman, operated twice upon a two-year-old hunting-dog. Through palpation he was able to detect the presence of a foreign body in the abdominal cavity. One-half inch to the left of the mesial line an incision was made eight inches in length, which exposed the occluded bowel much enlarged. This was divided to the side, upon the free contour, sufficient to permit the easy extraction of the extraneous material.

The latter proved to be an ordinary smooth gravel stone weighing something over an ounce. The union of the intestine was accomplished by stitches inserted by minute curved needles; upon one side of the gut-wound the needle was inserted, passed through and transversely across the wound to enter the opposite lip, after which it was brought diagonally to the first side, and so on until the aperture was obscured.

It is sufficient to avoid infiltration at the point by leaving the mucous membrane unpunctured by the needle; the serous coat must, of course, come in contact upon the circumference

of the intestine. The portion sewed is further disinfected by a tepid solution of boracic acid, and replaced within the cavity; after this the external wound is closed by the interrupted suture. For twelve hours only pure milk was administered; for the next few days milk and water, and after ten days the patient was discharged.—*Wochenschrift.*

RINDERPEST IN JAPAN.

According to the last official report, publishing the status of rinderpest in Japan, the annihilation has proceeded so far that now only individual or sporadic cases may be found in Osoka, Kobe and Yokohama. The course of the disease gradually assumed a less virulent aspect, while in exceptional cases recovery took place without the slightest medical interference.

The total loss from the epizootic amounted to 4,181 head of cattle; of these 760 died of rinderpest, *per se*, 2,936 sick were destroyed as a sanitary precaution, and 485 healthy subjects were slaughtered as a prophylactic measure. The city of Osaka was the greatest sufferer from the pest; here 127 animals succumbed, and 931 affected were destroyed; no healthy cattle included in the latter.

The porportionately small number of live stock in the country—amounting in 1887 to only 1,020,222 head—makes the loss a relatively significant one. The Government has paid indemnity claims for healthy victims amounting to 50,000 yen.

The individual holders, however, suffer to a greater extent, since the consumption of meat and milk has declined to one-third, probably due to superstitious influence or mistrust. The invasion of the virus could be traced from Corea to three districts of the Kiushiu Island, and to two ports in Japan proper. The details of its advancement from these ports to Kobe—the largest harbor in the country—thence by sea to Yokohama and Tokio, even as far north as the island of Yeso, do not vary from the usual course of propagation of such malignant contagiums.—*Prof. Janson, Tokio, Japan.*

SOCIETY MEETINGS.

VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY.

The twenty-ninth regular meeting of the Veterinary Medical Association of New Jersey, was held at Davis parlors, 943 Broad St., Newark, N. J., on Aug. 10th, 1893.

The meeting was called to order by the President, Dr. J. Gerth, Jr., at 10 o'clock A. M., sixteen members present.

After the regular business of the Association was completed, Dr. Geo. A. Banham, F.R.C.V.S., of Cambridge, England, gave an interesting talk on the methods of shoeing horses in England and in this country. He also spoke of the very bad roads here, and said that the smallest country town in England had better roads than our large towns. Dr. Robert Ward, of Baltimore, Md., also spoke on shoeing and the economy of the foot, and afterwards delivered an address on diseased cattle and meat. He told of some of his experience in trying to destroy diseased meat, but under the existing law it is almost impossible to do so. After the doctor's address the meeting adjourned for dinner.

The afternoon session was a general discussion of the subjects presented by the speakers at the morning session, the time being fully occupied, as the subjects were those in which all were interested.

The Association elected Dr. W. B. E. Miller, of Camden, N. J., as a delegate to the first International Veterinary Congress of America, to be held at Chicago, Oct. 16-20, 1893.

A vote of thanks was tendered to Drs. Banham and Ward for their kindness in adding so much to the enjoyment of the members present, by their addresses.

The meeting adjourned at five o'clock P. M.

PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION.

The semi-annual meeting will be held Sept. 5th in Scranton at the Y. M. C. A. building, at 10 A.M.

The following essays are announced: W. L. Zuill, Differential Diagnosis of Colics. J. H. Timberman,————. W. L. Nunan, The Veterinarian Socially. Jacob Helmer, Inflam-

mation of the Internal Structures of the Eye. Leonard Pearson, Anthrax. W. H. Ridge, Employment of Force in Dystocia. Reports of Cases, by Leonard Pearson, Hæmaturia. W. H. Ridge, Fracture of Vertebræ.

S. J. J. HARGER, Sec'y.

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